TRMM Flight Operations Monthly Status Review (MSR)

August 1st, 2001

FOT Subsystem Overview

- Operations Status
  - Flight Ops Summary - Lou Kurzmiller
  - Electrical - Andy Calloway
  - Thermal - Dave Sepan
  - RCS & RF / Comm. - Dave Sepan
  - ACS & FDS / C&DH - Mark Fioravanti
  - Power & Deployables - Justin Knavel
  - LIS - Justin Knavel
  - CERES & VIRS - Mark Fioravanti
  - TMI - Dave Sepan
  - PR - Andy Calloway
  - Ground System - Dan Palya
  - Upcoming Activities - Andy Calloway

Flight Operations Summary

- Supported 540 SN events in July
  - 2 Yaw Maneuvers; now +X
  - 6 Delta-V Maneuvers
- No Anomaly or Event Rpts
  - 1 Late Acq
  - E-mail virus spread through trmm-weekly listserver, no affected computers in MOC.

Flight Operations Summary

- Notable Events
  - 3rd Solar Array 55 deg Off-pointing test (05 July)
  - Loaded Magfield 95 patch & TSM 21 to EEPROM
  - Participated in Boost ORR & ESMO CAM
  - Preparing for Orbit Boost
  - Rel 9.0 on all MOR strings
- PACOR-A is now operational prime
- FOT personnel status
  - One console analyst joined FOT

Flight Ops Summary

SPECIAL SPACECRAFT EVENTS AND ACTIVITIES FOR TRMM 2001													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	**TOTALS**
2	8	7	10	12	8	7	6						58
2a	1	1	1	2	1	1	2						9
2b	0	0	0	0	0	0	0						0
2c	0	0	0	0	0	0	0						0
3	1	0	1	1	0	1	0						4
3a	1	4	2	9	3	5	11						35
3b	3	2	1	3	2	0	4						15
3c	1	1	1	5	1	1	0						10
3d	0	0	0	0	0	0	0						0
3e	1	0	0	0	1	2	0						4
3f	2	2	5	2	2	0	1						14
4	3	1	0	0	1	0	6						11
4a	0	2	2	2	2	2	4						14
4b	1	1	2	1	2	1	2						10
4c	0	0	0	0	6	0	0						6
4d	5	0	3	8	4	0	8						28
4e	0	0	0	1	0	12	0						13
5	3	0	2	4	1	2	3						15
5a	0	0	0	0	5	4	10						19
5b	0	5	0	0	0	0	0						5
5c	0	0	0	0	0	0	0						0
TOT:	30	26	30	50	39	38	57	0	0	0	0	0	270

LEGEND

STANDARD CATEGORIES		**TRMM-SPECIFIC SUB-CATEGORIES AND EXAMPLES**
1	Targets of Opportunity	N/A
2	S/C Maneuvers	DeltaVs **(2)** , 180° Yaw Maneuvers **(2a)** , 90° Yaws **(2b)** , Deep Space Cals **(2c)**
3	Unplanned Commanding	Blind Acqs **(3)** , Patch Loads **(3a)** , Manual DS Ops due to Blind Acqs, MI, etc. **(3b)** , EPVs Fail **(3c)** , VIRS Reset Ops **(3d)** , Anomaly Recoveries **(3e)** , Generic Late Acqs - GCMRs / DS Ops **(3f)**
4	Customer Requests	PR **(4)** , VIRS **(4a)** , LIS **(4b)** , CERES **(4c)** , FSW **(4d)** , AETD **(4e)**
5	Ops due to Celestial Phenomena	UTCF / FS Ops **(5)** , Power Ops - Autospru, TSMs, C/D **(5a)** , Xpdr Offset Ops **(5b)** , Leonids **(5c)**
6	Pre-Launch Testing	N/A
7	L&IOC Operations	N/A
8	EOL Operations	Delta-H Firings **(8)** , Reentry Maneuvers **(8a)**

NOTE: This Record Documents S/C Activities and Does Not Include Other Special Activities Such as Ground System Testing, Simulations, Trending, or New Database, Script, Code, or Procedure Development...

Thermal / Electrical Subsystems

- The Thermal subsystem remains nominal
  - No operational issues during the 402.5 km boost or operationally after arrival

- The Electrical subsystem remains nominal
  - No operational issues during the 402.5 km boost or operationally after arrival

RCS Subsystem

- RCS performed 6 successful Delta-V maneuvers (#319 - #324)
  - Current fuel remaining is 392 kg
- EOL estimate at the current altitude is approximately **March, 2003**, using 157kg of fuel as a baseline. A new estimate will be provided following the 402.5 km boost.
- No Open RCS Anomaly or Event Reports
- Upcoming Events
  - Review of RCS Subsystem for 402.5 km boost is complete with no open issues or concerns.
  - Continue to review and train with Delta-H procedure, EOL scripts, and the "one-shot" procedure.
  - Review all required steps for a 30+ minute Delta-V maneuver and test with the simulator.

RF Subsystem

- 1 Generic Late Acquisition
  - 206/043000z TDE event: Locked up @ 043151z. One fwd reacq was sent. Dump/pb were performed. All data recovered.
- Frequency offsets (monthly average)
  - Transponder #1 = +690.155 Hz
  - Transponder #2 = -690.447 Hz
- No RF Event Reports or MOCRS this month
- Upcoming Events
  - Offset of transponder 2 frequency may still occur this year.

ACS Subsystem

- Solar Array Off-Pointing Tests.
  - 3rd test conducted on 01-187 (Thurs., July 5th)
  - See power section for more details.
- Tables and Patches for Boost Activities.
  - Table #54: New pitch and yaw Delta-V position error limits of 0.191986 radians (11 deg), and roll of 11 deg, on 01-211 (Mon., July 30th)
  - Table #81: New roll and pitch position error limits for Earth acquisition exit criteria of 0.03 radians (1.72 deg), on 01-211 (Mon., July 30th)
  - Mag. Field 1995 Epoch patch applied to EEPROM, on 01-207 (Thurs., July 26th) (2000 Patch will be delivered later this year)
  - Remaining Tables to be installed before boost, Tables #85 & #73 to allow for burns longer than 1 min. in length.
- FSW has uncovered the need for a change in SunAcq to Normal recovery process during their testing: a change to ACS Table 54 will prevent solar arrays from moving to an incorrect position while in YawAcq mode

FDS/C&DH Subsystems

- Boost Activities
  - Table #21: TSMs committed to EEPROM, on 01-207 (Thurs., July 26th)
  - Building new Delta-V RTS #117, to support longer maneuvers.
- UTCF Status;
  - Three Adjustments were performed. One on 01-185 (Wed. July 4th), another on 01-196 (Sun., July 15th), and the other on 01-206 (Tues., July 25th). The next adjustment is expected on 01-215 (Fri., August 3rd)
  - Current UTCF value is 31535996.820139 sec
  - No FS Adjustments were performed, current value is x'7C6'. The next Adjustment is expected on 01-215 (Fri., Aug 3rd), and will be adjusted to x'7D2'.

FDS/C&DH Subsystems

- Planned RTS Changes
  - Delayed until Boost Activities have been completed.
  - Nominal TDRS AOS RTS format changes to allow easier modification as DS storage status changes, and to simplify transponder offsets if required.
  - Initially will be performed with RTSs 65 - 68, other AOS RTSs may also be converted later.

Power Subsystem

- On 01-181 (June 30th), Auto-SPRU was disabled after the high Beta angle period.
- On 01-181 (June 30th), TSMs 33 and 34 (End of Day SOC < 95%) tripped and activated RTS 13, but the S/C was already in the proper configuration (CCM_2/VT5 with Auto-SPRU disabled).
  - Delta V operations started near the end of eclipse and ended 9 minutes into sunlight(A longer than normal recovery, due to ESA Interference). Therefore, the Solar Arrays were stopped at the Feather position (0 degrees) for the first 9 minutes of sunlight.
  - The Solar Array current toggled above and below the threshold (10 amps) several times, which caused the Day/Night flag to also toggle back and forth. When the Day/Night flag changed from Night to Day to Night, the End of Day SOC was erroneously set to ~82%. All counters were properly restored on the next orbit.
  - If the Solar Arrays are permanently Feathered (EOL activities), then the thresholds will need to be adjusted.

Power Subsystem

- Off-pointing the Solar Array by 55 degrees
  - A successful 2 orbit Solar Array off-pointing test was conducted on 01-186 (July 5th). The Beta angle was approximately 26 degrees.

Deployables Subsystem

- Solar array drives and HGA continue to operate nominally.

LIS Instrument

- Two Routine MSFC real-time command requests were performed on 01-190 (July 9th) and 01-212 (July 31st) to reduce packet sequence errors
- No open issues

CERES/VIRS Instruments

- **CERES**.
  - Powered OFF.
- **VIRS**, continues to operate nominally.
  - Two sets of VIRS Solar Calibrations were performed on 01-209 (Sat., July 28th).

TMI / PR Instruments

- No Open Issues with the TMI instrument

- Six PR Requests in July in preparation for Boost activities:
  - External Cals over ARC on 7/16, 7/17, 7/18, 7/19 (57,69,67,61)
  - LNA Analysis on 7/23 and Log Amp Check on 7/30
- No new PR interference was reported by NASDA in July
- PR range bin offsets will be performed in realtime during boost operations when altitude is between 360km and 375km (timing is not critical)
  - Bins 1 and 49: Change Offset from 0 to 6
  - Bins 2 and 48: Change Offset from 0 to 4
  - Bins 3 and 47: Change Offset from 0 to 3
  - Bins 4 and 46: Change Offset from 0 to 1

Ground System

- PACOR-A is now operational and has been prime system since 7/24.
  - PACOR-II will continue to operate in parallel as backup until end of August
  - CDs are being received at MOC, electronic file transfers occur each night, and mini level-0 data requests have been conducted
- System Software Release 9.0 is now installed and operational on all strings and in SOTA-7
- TR3WS3 experienced a power supply failure and it was replaced - no further problems have occurred
- MP load Integrated Print problem due to memory leak still occurs intermittently - workaround is to perform soft reboot of the workstation

Upcoming Activities

- 0-2 Months
  - Perform successful ascent maneuvers to the new 402.5 km operational altitude
  - Establish new trend baseline for full seasonal changes at the new operational altitude
  - Test and implement revised SunAcq exit process
  - Test and install new Transponder-2 AOS Offset Relative Time Sequences
  - Perform SA 55° offset long-duration test
  - Test and install new TDRS HGA AOS RTSs

Upcoming Activities

- 2-3 Months
  - Complete testing and training with PSIB alternate telemetry patch
  - End Of Life Planning, Testing, and Simulations continue
  - Continue to close open CCRs, MOCRs, and MSR Action Items
  - Leonids 2001 will occur in November